

Chemistry 129.03 - General Chemistry - Spring 2017

Week #2

Class Meetings:

Monday, January 30. Problem Set #1 due.

General Properties of Solutions. We examine types of solutions and ways to express concentration.

Reading for today: Sections 3.3-3.4

Start our discussion of the greenhouse gases module, we will consider some of the factors affecting the temperature of a planet (Session 1).

Wednesday, February 1. *Session 2 GHG Module: How can we tell the identity of gases on other planets?* Continue our discussion of atomic structure and Bohr's model of the atom.

Reading for today: Sections 2.1-2.3

Friday, February 3. Quiz #1 at the beginning of class (Stoichiometry and Significant Figures).

Finish session 2 of the GHG Module.

How can we tell the identity of gases on other planets? Continue our discussion of atomic structure and Bohr's model of the atom. Demos: Atomic Line Spectra.

Reading for today: Sections 6.1-6.2

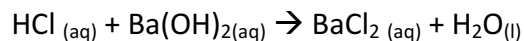
Assignment

Problem Set #2 - Due Monday, February 6 (at the beginning of class). Late homework will not be accepted.

1. How many grams of NaCl are needed to prepare 250.0mL of a 0.0475M solution? (b) How many mL of a stock solution of 10.0M HNO₃ would you have to use to prepare 0.450L of 0.500M HNO₃?

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2. Balance the following reaction:



What volume of a 0.150M $\text{Ba}(\text{OH})_2$ solution is required to completely react with 125mL of 0.150M HCl? What is the concentration of the BaCl_2 solution formed?

3. Based on Rutherford's nuclear theory, what does an atom look like?

4. Complete the following table:

Symbol	$^{35}_{17}\text{Cl}^{1-}$			$^{33}_{15}\text{P}$
Protons		20		
Neutrons			48	
Electrons			36	
Atomic Number			36	
Mass Number		40		
Charge		+2		

5. A typical carbon-carbon bond requires 348kJ/mol to break. What is the longest wavelength of radiation with enough energy to break a carbon-carbon bond? What type of radiation is this?
6. Determine whether each of the following transitions in the hydrogen atom corresponds to absorption or emission of energy:
- from $n=3$ to $n=1$
 - orbit of radius 2.12\AA to one of 8.46\AA
 - from $n=2$ to $n=4$
 - orbit of radius 4.76\AA to one of 0.529\AA
7. Using $E_n = -2.18 \times 10^{-18}\text{J} \left(\frac{1}{n^2}\right)$, calculate the energy of an electron in the hydrogen atom when $n=3$ and when $n=5$. Calculate the wavelength and frequency of the radiation released when an electron moves from $n=5$ to $n=3$. What type of radiation is this?